

CLAIMS

1. A mixed liquid droplet forming method comprising:

5 a first step in which a voltage is applied first between a raw material liquid housed in one of a plurality of nozzles and a flat electrode disposed opposite the nozzle to discharge the raw material liquid from the front end of the nozzle and form a droplet made of the raw material liquid on a droplet forming object disposed between the front end of the nozzle and the flat electrode; and

10 a second step in which a voltage is applied between a raw material liquid housed in the other nozzle of the plurality of nozzles and the flat electrode to discharge the raw material liquid from the front end of the nozzle, and the droplet is mixed with the raw material liquid to form a droplet of the mixed liquid.

20 2. The mixed liquid droplet forming method according to Claim 1,

25 wherein in the first step, an electrode is provided on the outer circumference of at least one nozzle of the plurality of nozzles and the electrode is supplied with a potential equal to or higher than the potential of a raw material liquid inside the nozzle.

3. A mixed liquid droplet forming apparatus,

comprising:

a plurality of nozzles that house a plurality of raw material liquids and discharge the plurality of raw material liquids independently from each other;

5 a flat electrode disposed opposite the front ends of the plurality of nozzles; and

a voltage applying unit that applies a voltage between raw material liquids housed in the plurality of nozzles and the flat electrode.

10 4. The mixed liquid droplet forming apparatus according to Claim 3, further comprising a control unit that controls the voltage applying apparatus so that a voltage is applied to an arbitrary raw material liquid among the plurality of raw material liquids.

15 5. The mixed liquid droplet forming apparatus according to Claim 4,

wherein an electrode is provided on the outer circumference of at least one nozzle of the plurality of nozzles, and the control unit controls the voltage
20 applying unit so that the electrode is supplied with a potential equal to or higher than the potential of the raw material liquid.

25 6. An ink jet printing method for printing a color image on a printing object by using a plurality of inks, comprising:

a first step in which a plurality of ink nozzles

which house the plurality of inks and a dilution nozzle which houses a dilute solution that can dilute the inks are used, and the ink or the dilute solution is discharged from the ink nozzle or the dilution nozzle by an electrostatic sucking force to form a droplet on the printing object; and

a second step in which the ink or the dilute solution is discharged from the ink nozzle or the dilution nozzle by an electrostatic sucking force, and the inks or the dilute solution are mixed in the droplet to form a droplet in an additive color.

7. The ink jet printing method according to Claim 6,

wherein in the first step, a droplet made of the dilute solution is formed on a printing object by discharging the dilute solution from the dilution nozzle.

8. The ink jet printing method according to Claim 6, further comprising, after the second step, a step in which the chroma of the droplet is measured, and based on the measured chroma, the quantity of discharging the ink or the dilute solution is controlled so that the chroma of the droplet becomes a desired chroma.

9. The ink jet printing method according to Claim 7,

wherein in the first step, an electrode is

provided on the outer circumference of the dilution nozzle and the electrode is supplied with a potential equal to or higher than the potential of the dilute solution inside the dilution nozzle.

5 10. An ink jet printing apparatus for printing a color image on a printing object by using a plurality of inks, comprising:

 a plurality of ink nozzles which house the plurality of inks, respectively

10 a dilution nozzle which houses a dilute solution that can dilute the inks;

 a flat electrode disposed opposite the front ends of the ink nozzles and the dilution nozzle; and

 a voltage applying unit which applies a voltage
15 between the inks and the dilute solution and the flat electrode, wherein

 the plurality of ink nozzles and the dilution nozzle are disposed apart from each other.

20 11. The ink jet printing apparatus according to Claim 10, further comprising a control unit which controls the voltage applying unit so that a voltage is applied to an arbitrary liquid among the inks and the dilute solution.

25 12. The ink jet printing apparatus according to Claim 11,

 wherein an electrode is provided on the outer

circumference of the dilution nozzle, and the control unit controls the voltage applying unit so that the electrode is supplied with a potential equal to or higher than the potential of the dilute solution.

5 13. The ink jet printing apparatus according to Claim 11, further comprising:

an illuminating light source which illuminates a droplet formed on the printing object; and

10 a chroma measuring unit which measures the chroma of the droplet illuminated by the illuminating light source, wherein

the control unit controls the voltage applying unit based on the chroma of the droplet measured by the chroma measuring unit so that the chroma of the droplet becomes a desired chroma and adjusts the quantity of discharging the ink or the dilute solution.

15 14. An ink jet printing electrode-attached nozzle which is used in an ink jet printing apparatus including a flat electrode and disposed opposite the flat electrode, comprising an ink nozzle housing only an ink and an electrode provided on the outer circumference of the nozzle.

20 15. An ink jet printing electrode-attached nozzle which is used in an ink jet printing apparatus including a flat electrode and disposed opposite the flat electrode, comprising a dilution nozzle that

houses only a dilute solution and an electrode that is provided on the outer circumference of the dilution nozzle.

16. A nozzle which houses a single raw material
5 liquid,

wherein an electrode is provided on the outer circumference of the front end of the nozzle.